

What is claimed is:

1. A detector array for a CT system comprising:
a plurality of detector elements along both an X-axis and a Z-axis;
wherein the detector elements are arranged in a staggered pattern.
- 5 2. The CT system detector array of claim 1 wherein two neighboring detector elements in the Z-axis are coupled together.
3. The CT system detector array of claim 2 wherein the coupled detector elements are staggered throughout the detector module.
4. The CT system of claim 1 wherein a first plurality of detector elements are
10 coupled together and a second plurality of detector elements are coupled together and wherein the first plurality of coupled elements are staggered with respect to the second plurality of coupled elements and the rest of the detector array follows a similar pattern.
5. A method for sampling for use with a CT system comprising:
providing a plurality of detector elements in a detector array;
15 connecting an FET array to the detector elements electronically,
determining the number of slices required and the thickness of each slice, and
providing a staggered detector element array.
6. The method for sampling of claim 5 further including the step of
electronically coupling together two neighboring detector elements in the Z-axis.
- 20 7. The method for sampling of claim 6 further including the step of staggering the coupled elements through the detector module.
8. The method for sampling of claim 7 further including the step of:

providing a first plurality of detector elements that are coupled together;
providing a second plurality of detector elements that are coupled together;
staggering the first plurality of coupled elements with respect to the second
plurality of coupled elements;

5 coupling the remaining detector elements in the module in a similar pattern.

9. A detector module for use in a computed tomography machine, said
detector module apparatus comprising:

a plurality of detector elements;

a switching array electrically connected to the detector elements;

10 a decoder electronically connected to the switching array;

said decoder coupling detector elements together to form a staggered array of
detector elements.

10. The detector module of claim 9 wherein the switching array comprises a
plurality of field effect transistors, wherein each field effect transistor has an input, an
15 output, and a control line.

11. The detector module of claim 10 wherein the decoder controls the
switching array to combine outputs of the detector elements.

12. The detector module of claim 11 wherein two neighboring detector
elements in the Z-axis are coupled together.

20 13. The detector module of claim 12 wherein the coupled detector elements
are staggered through the detector module.

14. The detector module of claim 13 wherein a first plurality of detector elements are coupled together and a second plurality of detector elements are coupled together and wherein the first plurality of coupled elements are staggered with respect to the second plurality of coupled elements and the rest of the detector array follows a similar pattern.

15. The detector module of claim 14 wherein the detector elements comprise:
a collimator array;
a scintillator array;
a photodiode array optically coupled to said scintillator array;
a switching array electrically connected to the photodiode array;
a decoder electronically connected to the switch array, said decoder being configured to control operation of said switch apparatus to combine data signals in accordance to select a staggered pattern of data transmitted during detection of the data from the detector module.

16. A detector module for a computed tomography system, said detector module comprising:

a collimator array;
a scintillator array;
a photodiode array optically coupled to said scintillator array;
a switching array electrically connected to the photodiode array;
a decoder electronically connected to the switch array, said decoder being configured to control operation of said switch apparatus to combine data

signals in accordance to select a staggered pattern of data transmitted during detection of the data from the detector module.

17. The detector module of claim 16 wherein the switching array comprises a plurality of field effect transistors, wherein each field effect transistor has an input, an
5 output, and a control line.

18. The detector module of claim 17 wherein two neighboring detector elements in the Z-axis are coupled together.

19. The detector module of claim 18 wherein the coupled detector elements are staggered through the detector module.

10 20. The detector module of claim 19 wherein a first pair of detector elements are coupled together and a second pair of detector elements are coupled together and wherein the first pair of coupled elements are staggered with respect to the second pair of coupled elements and the rest of the detector array follows a similar pattern.

21. A method for summing outputs from a diode array in a multislice
15 photodetector, having an array of scintillators optically coupled to an array of diodes, said method comprising summing a number of selectively connected cells in the Z-direction.

22. The method for summing outputs from a diode array of claim 21 wherein two cells are coupled together in the Z-direction.

20 23. The method for summing outputs from a diode array of claim 22 wherein the coupled elements are staggered in the X-direction.

24. The method for summing outputs from a diode array of claim 23 wherein a first pair of detector elements are coupled together and a second pair of detector elements are coupled together and wherein the first pair of coupled elements are staggered with respect to the second pair of coupled elements and the rest of the
5 detector array follows a similar pattern.